

CLAIMS

What is claimed is:

1. A printer system, comprising:
  - a roll of labels, wherein each label comprises
  - 5 a radio frequency identification (RFID) tag;
  - an RFID reader system comprising:
    - an RFID reader; and
    - an RFID antenna, wherein the RFID antenna
    - comprises:
    - 10 an RF field spreader;
    - an RF divergent conductor, with a
    - divergent side contacting the RF field
    - spreader and an opposite side forming an
    - RF source node;
    - 15 a first ground plane adjacent to the
    - RF field spreader; and
    - a second ground plane adjacent to the
    - RF divergent conductor; and
    - a print head, wherein the RFID antenna is
    - 20 between the roll of labels and the print head.
2. The printer system of claim 1, wherein the RF
- field spreader is a rectangular-shaped conductor.
- 25 3. The printer system of claim 1, wherein the RF
- divergent conductor is a triangular-shaped conductor.
4. The printer system of claim 1, where the RF
- field spreader and the RF divergent conductor are copper.
- 30 5. The printer system of claim 1, wherein the print
- head is a thermal print head.

6. The printer system of claim 1, wherein the RFID tag is located in an approximately middle section of the label along the width-wise direction.

5        7. The printer system of claim 1, wherein the RF field spreader and the RF divergent conductor are formed on a first portion of a printed circuit board assembly.

8. The printer system of claim 7, wherein the  
10 second ground plane is formed on a second portion of the printed circuit board assembly.

9. The printer system of claim 8, wherein the first and second portions are approximately the same size.  
15

10. The printer system of claim 1, wherein the first ground plane is smaller than the second ground plane.

20        11. The printer system of claim 1, wherein the RFID tag passes over the RF source node source.

12. The printer system of claim 1, wherein the RFID reader system writes to and reads from the RFID tag.  
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13. The printer system of claim 1, wherein the RFID antenna further comprises a microstrip transmission line to transmit an RF signal from an edge of the antenna to the RF source node.  
30

14. The printer system of claim 1, wherein the RFID reader system operates in a frequency range of approximately 902 MHz to 928 MHz.

15. The printer system of claim 1, wherein the RFID antenna comprises a dielectric material having a dielectric constant of at least 4.0.

5        16. A printing system, comprising:  
         a host computer, wherein the host computer is  
         capable of transmitting a data stream using a first  
         programming language; and  
         a printer system, comprising:  
10           an extractor coupled to receive the data  
         stream, wherein the extractor extracts a first  
         portion of the data stream and generates RFID  
         commands from the first portion;  
         a parser coupled to the extractor, wherein  
15           the parser parses image portions from RFID  
         portions of the first portion of the data  
         stream;  
         an image formatter coupled to receive the  
         image portions from the parser;  
20           an RFID data formatter coupled to receive  
         the RFID portions from the parser;  
         a print sub-system coupled to the image  
         formatter for printing an image on a label; and  
         an RFID system coupled to the RFID data  
25           formatter for programming data on an RFID tag  
         in the label.

17. The printing system of claim 16, wherein the first programming language is different than the  
30 programming language from the printer system.

18. The printing system of claim 16, wherein the first portion is bar code commands.

19. The printing system of claim 16, wherein the extractor is a character substitution table.

20. The printing system of claim 18, wherein the  
5 extractor generates an RFID command from bar code data.

21. The printing system of claim 16, wherein the print sub-system comprises a thermal print head.

10 22. A method for printing labels from a roll, with each label having a radio frequency identification (RFID) tag, the method comprising:

passing a label over an RFID antenna;  
interrogating the RFID tag in the label;  
15 determining if the interrogating was  
successful;  
attempting N-1 additional interrogations until  
a successful interrogation is determined; and  
printing the label once a successful  
20 interrogation is determined.

23. The method of claim 22, further comprising receiving print and tag data from a host computer.

25 24. The method of claim 22, wherein the interrogating is reading data from the RFID tag.

25. The method of claim 22, wherein the  
interrogating is programming data in the RFID tag.

30 26. The method of claim 22, wherein N is 5 or less.

27. The method of claim 22, further comprising over striking the label if a successful interrogation cannot be determined after N interrogations.

5        28. The method of claim 22, further comprising halting operation of the process if a successful interrogation cannot be determined after N interrogations.

10       29. The method of claim 22, wherein the printing is by thermal printing.

30. A method of processing an label with an RFID tag, comprising:  
15       receiving, from a host computer, a data stream in a programming language;  
         extracting a first portion from the data stream;  
         formatting at least part of the first portion  
20       into an RFID command;  
         programming bar code data into the RFID tag using the formatted portion; and  
         printing the label using commands from the first portion of the data stream.

25       31. The method of claim 30, wherein the first portion are bar code commands.

32. The method of claim 30, further comprising  
30       parsing the RFID command to an RFID system and at least a portion of the data stream to a printer portion.

33. The method of claim 32, wherein the printer portion includes a thermal print head.

34. The method of claim 32, wherein the programming language is different than the programming language of the printer portion.